

CLAIMS

What is claimed is:

4. A method for providing collateral information for inclusion with an information stream, comprising steps of:

examining the information stream to recognize a presence of events that occur in the information stream;

automatically generating database queries from recognized events; and

analyzing database query results so as to rank and select database query results to be inserted into the information stream as collateral information.

2. A method as in claim 1, wherein the step of analyzing comprises a step of ranking the database query results based on a plurality of criteria.

3. A method as in claim 2, wherein the plurality of criteria comprise a score derived from a free text search of the database using text that is automatically extracted from the information stream, on a number of named entities appearing in the text and in the database query results, and on a taxonomy path score, where the taxonomy path score represents an amount of relatedness between a taxonomy-related information element found in the text and a predetermined taxonomy tree.

4. A method as in claim 1, wherein the database queries are automatically generated based on information corresponding to a list that identifies topics in text that is automatically extracted from the information stream, where the topics correspond to predetermined topic taxonomies.

5. A method as in claim 1, wherein the step of examining comprises a step of automatically extracting text from the information stream.

6. A method as in claim 5, wherein the step of examining further comprises steps of:

segmenting the text into sentences; and

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operating on the sentences to identify topics that correspond to predetermined topic taxonomies, wherein the step of automatically generating database queries operates on identified topics.

7. A method as in claim 5, wherein the step of automatically extracting text from the information stream comprises a step of operating a voice recognition system.

8. A method as in claim 5, wherein the step of automatically extracting text from the information stream comprises a step of extracting closed caption text.

9. A method as in claim 5, wherein the step of automatically extracting text from the information stream comprises a step of operating a character recognition system.

10. A method as in claim 5, wherein the step of automatically extracting text from the information stream comprises a step of also generating text that is descriptive of a number of human faces that are present in an image conveyed by the information stream.

11. A method as in claim 5, wherein the step of examining the information stream further comprises steps of segmenting the text into sentences and a step of operating on the sentences to identify topics that correspond to predetermined topic taxonomies and the presence of names of entities, and further comprising steps of assembling a list comprised of an identified topic having a start time and an end time, as well as any named entities that occur between the start time and the end time, assembling a query object comprised of named entities that occur between the start time and the end time of the identified topic, searching at least one database to identify a first set of stored documents that correspond to the topic, identifying a subset of the first set of documents that contain the named entities, identifying a second set of documents that correspond to words found in the text; scoring the returned documents based on a plurality of criteria and ranking the documents based on their scores.

12. A method for providing collateral information for multiplexing with an information stream, comprising steps of:

converting the information stream into text;

analyzing the text to identify information elements;

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automatically generating queries from the information elements for searching at least one database;

extracting data from database search results that is relevant to the information stream; and

multiplexing the data into the information stream for presentation at a destination of the information stream.

13. A method as in claim 12, wherein the step of extracting comprises a step of ranking the extracted information based on a plurality of criteria, and where the step of multiplexing uses the ranked data.

14. A method as in claim 12, wherein the step of extracting comprises a step of ranking extracted document information based on a score derived from a free text search of a document database using the text, on a number of named entities extracted from the text that are found in the documents, and on a taxonomy path score, where the taxonomy path score represents an amount of relatedness between a taxonomy-related information element identified in the text and a predetermined taxonomy tree.

15. A method as in claim 12, wherein the queries are generated based on information elements that correspond to a list of information elements identifying topics in the text being analyzed, where the topics correspond to predetermined topic taxonomies.

16. A method as in claim 12, wherein the step of analyzing the text comprises steps of segmenting the text into sentences and a step of operating on the sentences to identify topics that correspond to predetermined topic taxonomies, and wherein the step of automatically generating queries operates on identified topics.

17. A method as in claim 12, wherein the step of analyzing the text comprises steps of at least segmenting the text into sentences, identifying names of entities within the text, and a step of operating on the sentences to identify topics that correspond to predetermined topic taxonomies, and wherein the step of automatically generating queries operates on identified topics and ranks the database search results based at least on numbers of named entities found and on an amount of relatedness between a taxonomy-related information element identified in the text and a predetermined

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taxonomy tree.

18. A system for providing collateral information for inclusion with an information stream, said system operating in real time or substantially real time and comprising:

a subsystem for examining the information stream to recognize a presence of events that occur in the information stream;

a subsystem, having an input coupled to an output of said examination subsystem, for automatically generating database queries from recognized events;

a database for receiving said database queries; and

a subsystem, having an input coupled to an output of said database, for analyzing database query results so as to rank and select database query results to be inserted into the information stream as collateral information.

19. A system as in claim 18, wherein the analyzing subsystem employs ranking criteria comprised of a score derived from a free text search of the database using text that is automatically extracted from the information stream, on a number of named entities appearing in the text and in the database query results, and on a taxonomy path score, where the taxonomy path score represents an amount of relatedness between a taxonomy-related information element found in the text and a predetermined taxonomy tree, and wherein the query generation subsystem generates queries based on information corresponding to a list that identifies topics in the text that is automatically extracted from the information stream, where the topics correspond to elements of the taxonomy tree.

20. A system as in claim 18, wherein said examining subsystem comprises at least one unit for automatically extracting text from the information stream, a unit for segmenting the text into sentences and at least one unit for operating on the sentences to identify topics that correspond to predetermined topic taxonomies, wherein said query generation subsystem automatically generates database queries based at least in part on identified topics.

21. A system as in claim 20, wherein said text extracting unit comprises at least one of a voice recognition system, a system for extracting closed caption text, and a character recognition system.

22. A system as in claim 20, wherein said examining subsystem comprises a unit for generating text that is descriptive of a number of human faces that are present in an image conveyed by the information stream.

23. A system as in claim 20, and further comprising a unit for operating on the sentences to identify the presence of names of entities, and further comprising a unit for assembling a list comprised of an identified topic having a start time and an end time, as well as any named entities that occur between the start time and the end time, and where the query generation subsystem assembles a query object comprised of named entities that occur between the start time and the end time of the identified topic for searching said database to identify a first set of stored documents that correspond to the topic, a subset of the first set of documents that contain the named entities, a second set of documents that correspond to words found in the text; and where said analyzing subsystem scores the returned documents based on a plurality of criteria and ranks the documents based on their scores.

24 25. A computer-implemented method for generating collateral information from an audio/video stream, comprising steps of:

examining the audio/video stream to recognize a presence of events that occur in the audio/video stream;

generating database queries from recognized events; and

analyzing database query results so as to rank and select database query results to be presented as the collateral information.

Sub *AT* 25 26. A method as in claim ²⁴ 25, and further comprising a step of inserting the collateral information into the audio/video stream in real time or substantially real time.

26 27. A method as in claim ²⁴ 25, wherein the step of examining includes a step of generating a speech transcript from at least the audio portion of the audio/visual stream, and wherein recognized events comprise speech topics.

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~~27~~ ~~28~~ A method as in claim ~~25~~²⁴, wherein the audio/visual stream originates as a television broadcast signal.

~~28~~ ~~29~~ A method as in claim ~~25~~²⁴, wherein the audio/visual stream originates at a meeting, and further comprising a step of presenting the collateral information to meeting participants in real time or substantially real time.

~~29~~ ~~30~~ A method as in claim ~~29~~²⁶, wherein the step of presenting comprises a step of inserting the collateral information into the audio/video stream, and displaying the audio/video stream to the meeting participants.

~~30~~ ~~31~~ A method as in claim ~~29~~²⁶, and further comprising a step of archiving at least the collateral information.

~~31~~ ~~32~~ A method as in claim ~~25~~²⁴, wherein the database queries are automatically generated based on information corresponding to identified topics extracted from the audio/video stream, where the topics correspond to predetermined topic taxonomies.

~~32~~ ~~33~~ A method as in claim ~~25~~²⁴, wherein the step of examining includes steps of generating a speech transcript comprised of words from at least the audio portion of the audio/visual stream; segmenting the words into sentences; and operating on the sentences to identify topics that correspond to predetermined topic taxonomies, wherein the step of generating database queries operates on identified topics.

~~33~~ ~~34~~ A computer readable media having recorded thereon a program for providing collateral information for inclusion with an information stream, the program comprising instructions for examining the information stream to recognize a presence of events that occur in the information stream, for automatically generating database queries from recognized events; and for analyzing database query results so as to rank and select database query results to be inserted into the information stream as collateral information.